Aalto University
School of Business

GENDER GAP IN FINNISH VENTURE CAPITAL

Bachelor's Thesis
Ville Lehto
Aalto University School of Business
Finance
Spring 2019

Author Ville Lehto

Title of thesis Gender Gap in Finnish Venture Capital

Degree Bachelor's Degree

Degree programme Finance

Thesis advisor(s) Michael Ungeheuer

Year of approval 2019 **Number of pages** 22 **Language** English

Abstract

This study examines the existence of Gender Gap in Finnish Venture Capital scene. The question is approached with a unique data set consisting of funding rounds that were performed between the years of 2013 and 2018. As an additional dimension, the education of founders' is also brought into the equation. The results imply that female CEOs and founders often times raise smaller rounds, but obtain higher level of education than their male counterparts.

Keywords Venture Capital, Gender Gap

Contents

1. Introduction

1.1 Background

Gender Gap in Venture Capital, meaning the inequality in attracting investments between sexes, has been studied more actively after the famous Diana Project was published back in 1999 (Brush, Greene, Hart & Saparito 2001). Through the Diana Project it was found that under 4% of the Venture Capital investments, in the United States between the years of 1988 - 1999, was invested into companies with a female executive (Brush, Carter, Gatewood, Greene & Hart 2003). A study under the same methodology was carried later in 2018 for the period between 2011-2013 where it was found that the proportion of investments to companies with female executives had risen to 15% of the total Venture Capital financing in the US (Brush, Greene, Balachandra & Davis 2018).

Venture Capital financing has grown significantly in Finland during the recent years. In 2018, Finnish high growth companies received roughly 200m euros of financing from Venture Capitalists, double the amount of early 2010's (FVCA, 2019 a). While the supply side and syndicate activity of Finnish Venture Capital industry have been studied previously in great manner (Bertoni, Colombo & Quas 2015; Mäkelä & Maula 2006) there hasn't been any quantitative research focusing on the underlying demographics of the investment targets - companies and their respective founders.

At the same time, Finland has been ranked 4th by the World Economic Forum's Global Gender Gap Report (World Economic Forum 2018). Which is why I believe that there is a significant need for a quantitative research regarding this topic.

1.2 Research Objectives

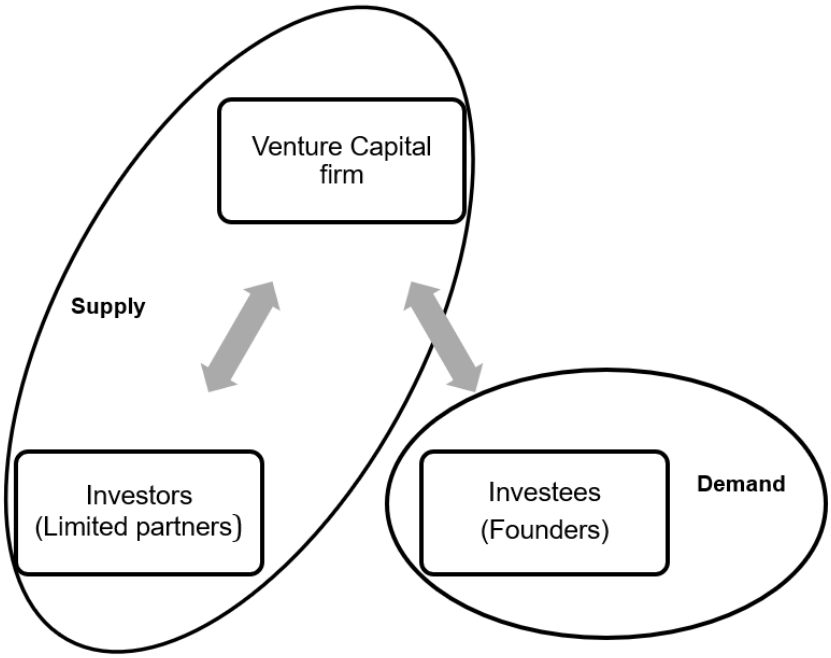
The research will focus on the Venture Capital rounds of Finnish startups and their respective founders and CEOs. Main research question, "The distribution of funding

between sexes and what are the underlying factors affecting the it?" is opened through a unique data set compiled from the information of published Venture Capital rounds that were performed in Finland between the years of 2013 and 2018. Hypothesis is that the distribution of capital between sexes will follow the results of earlier studies (Brush, Greene, Balachandra & Davis 2018) which were performed with US Venture Capital investment data.

1.3 Framework

The research focuses on the investees- or demand-side, of the Venture Capital-market triangle of Figure 1. This approach was taken due to the lack of existing research in this dimension within Finnish Venture Capital market. In addition, Gender Gap in Venture Capital is less often researched in general (Jennings & Brush 2013) when comparing to other sources of financing.

Figure 1. Conceptual Framework



The frameworks of Fried & Hisrich (1988) and Timmons & Bygrave (1997) were used as a basis of this Conceptual Framework.

Focusing to the demand-side of the previous visualization we aim to answer the main research questions, structured as below:

1. What is the distribution of Venture Capital investments between male and female CEOs, and cross-gender and all-male founding teams?
2. What is the education level of a typical Venture Capital funded CEO and are the differences between genders?

1.4 Structure

We will start with part two by going through the data in question, its data collection process and methodology used to address the research question. This is followed by the overview of results explained in part three. Part four focuses to interpret the results and offers reasonings and views based on earlier studies. Lastly, we conclude the thesis in part five, which is followed by three appendices providing additional background information.

2. Data and Methods

2.1 Data

The data sample includes Venture Capital financing rounds to Finnish companies or companies with at least one Finnish founder between the years of 2013 and 2018 enriched with demographic information. Financing rounds, that have not been disclosed publicly are not part of this sample. In addition, the sample includes all stages of Venture Capital financing: seed, growth and later stage.

The original data has been captured by Finnish Venture Capital Association (FVCA) and was provided by request for this study specifically. This sample included originally the following information, date of round, round size, financiers, target company name and type of funding. For the purposes of this study dimensions company legal name, business id, acting CEO name, CEO gender, CEO education, founder amount, amount of female founders and founding year were added to the data set.

The original data set included 760 venture capital financing rounds. This data was manually enriched and in case of missing data, a data point, such as insufficient proof of founding team composition, was excluded from the sample. After the data enrichment process, the final data set came down to 474 financing rounds into 304 unique companies.

The motivation for manual data mining was purely lack of existing databases for Finnish data regarding the given topic, with acceptable error margins. In other studies databases have been commonly used with great confidence for US data.

2.2 Analysis methods and data collection

This study utilizes very basic statistical methods such as sample mean and standard deviation. T-tests are also applied throughout the process. The motivation for this kind

of approach was to have comparable methodologies with previous research (Brush, Greene, Balachandra & Davis 2018).

The additional data dimensions were gathered with the classifications and sources as shown in the table below. The sources and data collection principles of this table are addressed in detail in Appendix 1.

Dimension	**Classification**	**Sources**
Company legal name	Official legal name of the company as of 27.3.2019.	Finnish Trade Register, Bloomberg Research
Business id	Business id of the company.	Finnish Trade Register, Bloomberg Research
Acting CEO name	Name of the person acting as the CEO of the company during the investment round.	Finnish Trade Register, Bloomberg Research, Crunchbase, Linkedin, Company Websites, News Articles
CEO gender	Gender of the CEO, male or female.	Finnish Trade Register, Crunchbase, Linkedin
CEO education	Highest achieved education level of the CEO reported in public sources. Based on a modified ISCED 1997-scale.	Linkedin
Founder amount	Total amount of original founders. Excluding advisors and non-founding equity partners.	Finnish Trade Register, Bloomberg Research, Crunchbase, Linkedin, Company Websites, News Articles
Female founder amount	Total amount of female founders.	Finnish Trade Register, Bloomberg Research, Crunchbase, Linkedin, Company Websites, News Articles
Founding year	Founding year of the company based on the date of Trade Register filing.	Finnish Trade Register, Bloomberg Research

3. Results

3.1 Distribution of Venture Capital investments between male and female CEOs and founding teams

During the years between 2013 and 2018, companies led by female CEOs received 3.26% of the total invested capital. The number of investments was 32, leading to an average investment of 1.26 million euros per round. Meanwhile, the average round size of companies with a male CEO, 440 investments, was 2.73 million euros (Table 1). A two-tailed t-test was also performed for the average round sizes between CEO gender, which showed that the difference was statistically significant (p-value 0.003).

Table 1: Venture Capital investments to companies in 2013 - 2018 per CEO gender

	Number of investments	**Invested in euros (millions)**	**Average and Median investment in euros (millions)**
Woman CEO	32 *6.78%*	40.5 *3.26%*	1.26 / 0.53
Male CEO	440 *93.22%*	1202.3 *96.74%*	2.73 / 1.2
Total	472 *100%*	1242.8 *100%*	2.63 / 1.1

The same method was applied to examine the distribution of venture capital financing between cross-gender founding teams and all-male founding teams. Cross-gender

founding team refers to a company which has one or more female founder in the original founding team. This approach was taken due to the fact that the sample included only eight investments to all-female teams. In addition, this approach has also been utilized in earlier research (Brush, Carter, Gatewood, Greene & Hart 2003) and therefore offers better comparability between results.

The number of investments to cross-gender founding teams totaled to 64, whereas there were 401 investments to all-male founding teams. Cross-gender founding teams received 10.85% of the total capital, which averages to 2 million euros per investment. The average round size for all-male founding teams was slightly higher, 2.63 million euros. As previously, a two-tailed t-test was applied to this data, which revealed a p-value of 0.17, meaning that statistical significance was not achieved for this comparison.

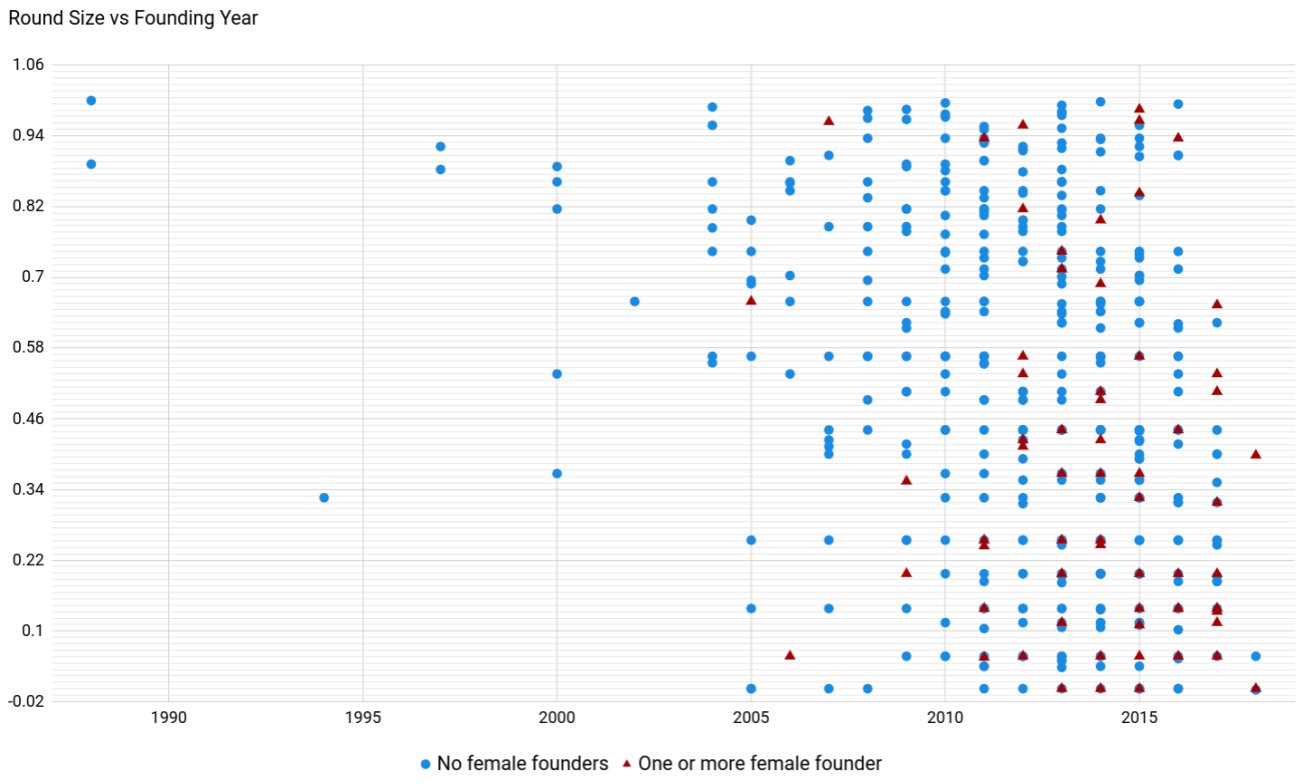
Table 2: Venture Capital investments to companies in 2013 - 2018 per founding team composition

	Number of investments	**Invested in euros (millions)**	**Average and Median investment in euros (millions)**
Cross-gender founding team	64 *13.76%*	128.2 *10.85%*	2.00 / 0.58
All-male founding team	401 *86.24%*	1053.4 *89.15%*	2.63 / 1.2
Total	465 *100%*	1181.6 *100%*	2.54 / 1.1

To analyze the maturity of companies based on founding team composition. The round size vs Founding year visualization (Figure 2) compares the round size of a given company (y-axis), based on founding team composition, to founding year of the company (x-axis). All-male founding teams are marked with blue circles, whereas cross-gender founding teams are marked with red triangle.

For more suitable comparability, the round size was broken down to percentiles on 0 - 1 scale, where largest rounds receive values close to 1 and smallest rounds receive values close to 0.

Figure 2. Round Size vs Founding Year



3.2 What is the education level of a typical Venture Capital funded CEO and are there differences between genders?

To study the education perspective, level of education was added to the data set on a modified ISCED 1997-scale (1-6). Where value 6 represents doctoral studies, value 5 university studies in general, value 4 applied sciences. The classification is based on the highest pursued degree. Due to the lack of data points, levels from 1 - 3 were left out from the comparison (Table 3) below.

A two-tailed t-test was performed to evaluate the distinction between the education levels, which revealed that CEOs with education level 6 raise larger rounds on average when comparing to levels 4 and 5 together, this resulted a p-value of 0.049 and can be therefore considered as a statistically significant result.

Table 3. Investment rounds by education level

	Average Round Size (M€)	**Median Round Size**	**% Male / % Female**
Education level 6 *n = 69*	3.85	1.7	88.4% / 11.6%
Education level 5 *n = 301*	2.6	1.1	93.4% / 6.6%
Education level 4 *n = 33*	0.78	0.5	93.9% / 6.1%

In addition to Table 3, female CEOs with an education level of 6 raised on average 0.9 million euros per round, whereas male CEOs with equivalent education raised 4.2 million euros on average.

4. Discussion and findings

4.1 Comparison of results

In this part, the results are discussed in more detail and reflected with earlier studies and try to interpret what factors could be affecting the results. First, we will focus on the results of CEO gender comparison, followed by founding team composition and closing the part with education level comparison results.

As Table 1 shows, women CEOs raise significantly smaller Venture Capital financing rounds in Finland than their male counterparts. This kind of CEO-based approach has not been previously discussed in earlier studies, hence it is hard to put the results into perspective. However, the results of Table 2, where the distinction is made on the founding team level, we are able to witness somewhat similar results as in the earlier studies performed with the US data (Brush, Greene, Balachandra & Davis 2018). The percentage amount of investments to companies with a female executive between the years 2011 - 2013 was 15% on average. Table 2 shows that the results are very close to this with Finnish founder team composition-based data, on average 13.76% of investments was received by companies with one or more female founder.

Interestingly, the US data also shows that companies with one or more females in the executive team raised 12 million dollars on average, whereas all-male executive teams raised only 8 million dollars on average per financing round. This is controversial with the Finnish data, as Table 2 shows, that the average round for cross-gender founding teams was 2 million euros and 2.63 million euros for all-male founding teams. However, as previously discussed, this difference is not statistically significant, but still an interesting phenomenon between the two data sets.

Time series approach of Figure 2 shows us that cross-gender founding teams are more common in companies that are founded in the recent years. This type of trend has been also captured with the US data (Brush, Greene, Balachandra & Davis, 2018), when

comparing the results of Diana Studies with the results of the revisit study of years' 2011- 2013, the amount of female executives receiving investments has tripled.

By examining the results of Table 3, it becomes evident that female CEOs are more commonly highly educated than male CEOs raising Venture Capital investments. At the same time, the data shows that higher education level correlates with higher investments size. However, female CEOs with level 6 education, tend to raise significantly smaller rounds on average when compared with male CEOs. Although, it is unclear what specific domain the CEOs of the data sample have studied. This is crucial since a report from FVCA (FVCA 2018) reveals that over 50% of the Venture Capital investments in Finland were directed to ICT-companies during the years of 2017 and 2018.

Appendix 2 shows the gender split of ICT-students in Finnish universities between the years of 2001 - 2017. There is a clear underrepresentation of female students in this sector, but the percentage of female ICT-students, on average 17.3%, cannot explain directly the low number of rounds with female CEO (Table 1) which is only 6.6%. When looking at the distribution of female and male entrepreneurs in Finland by industry (Appendix 3), we can see that even though female entrepreneurs represent one third of all entrepreneurs in Finland, only 1% of all female entrepreneurs are from the Information and Communication industry. Meaning that only 9.9% of the entrepreneurs in that industry are women. This would suggest that the number of Venture Capital funded female CEOs could be driven by the mismatch in gender representation on high-tech and Venture Capital-heavy industries. However, the significantly lower average round size cannot be solely explained by this.

4.2 Is there a Gender Gap?

To address the question whether gender gap, inequality in attracting investments between sexes, exists in the Finnish Venture Capital scene, additional data should be brought in. To prove this, we should have reliable data regarding the fact that how many female founders seek for Venture Capital funding in the first place. An alternative method would be to analyze the performance differences of cross-gender and all-male founding teams. The data set in question does not measure the performance of a given company.

Brush, Greene, Balachandra, & Davis (2018) measure the performance of a company based on their valuation at given year. They found that companies with cross-gender executive teams have significantly higher, roughly 50%, valuations than the ones with all-male executive teams. Additional exit-event, (an acquisition, IPO or merger), was introduced as an additional performance measure to analyze the performance of companies based on the gender of the CEO. It was found that based on exit-events, female CEOs perform alike, or slightly better, than male CEOs. Another more recent study (Raina, 2016) found that female-led startups see 25% less exits than male-led startups. However, this performance difference disappeared when financiers of female-led startups were women. If these performance results would hold for Finnish data as well, one could argue that gender gap actually exists, since there is a significant difference in average rounds between male and female CEOs.

Kwapisz & Hechavarria (2017), propose that the difference in the distribution of Venture Capital financing between genders is driven by the fact that females do not seek for financing as often than male founders do. Still, this leaves open the questions that what could be causing this kind of behavior. Brush, Carter, Gatewood, Greene, & Hart (2003) point out that people have a psychological preference to interact with people that are like them, which leads to segregated networks. Given the fact that 82% of US venture capitalists are men (Statista 2018) and that the Finnish Venture Capital market got its first female partner during this year (FVCA, 2019 b) it could be reasonable to argue that

female founders seeking for venture capital are not on the same line with their male counterparts.

In a study conducted by Brooks, Huang, Kearney & Murray (2014), which studied the demographic factors of founders seeking for financing, it was found that male founders were 60% more likely to receive funding from an investor in a real-life pitching[1] competition than female founders.

To minimize the risk that the business ideas of male founders were significantly more prominent, which would explain their better success, the same test was conducted in the form of video pitching. This study included identical pitching videos one with male and one with female voice-over narration. These videos were then played to a test group consisting of randomly picked individuals without venture capital background. The results were that 68% of the participants chose to fund the business idea presented by male narrator. This could imply that there exists an unconscious bias[2] in the society towards the success of female entrepreneurs.

[1] Pitching refers to a presentation where you give a quick overview of your business idea, product or service usually in the form of stage presentation (Rusko, Härkönen & Petäjäniemi 2018).

[2] Unconscious bias is a term in psychology which means that the environment of an individual has shaped their thoughts in a manner that they are biased in a given topic without realizing it (Moule 2009).

5. Conclusion

In this thesis, I have analyzed the signs of Gender Gap in Finnish Venture Capital scene. In which, female CEOs tend to raise smaller financing rounds and at the same time, obtain higher level of education. The data does not directly prove the existence of Gender Gap, but as discussed previously, there is evidence of it. However, as mentioned there are multiple factors that should be taken into consideration, especially the lack of performance data for the sample companies, it is hard to prove the existence of Gender Gap.

Cross-gender founding teams seem to raise close to same proportion of total Venture Capital investments, both here in Finland and the US. However, the average investments are controversially smaller for Finnish cross-gender founding teams. In addition, the growth of cross-gender founding teams seems to follow the same trend in Finland as in the US during the 2000's.

As highlighted in part four, earlier research has shown evidence of potential unconscious bias towards female entrepreneurs. In addition, as the Finnish Venture Capital scene is even more male-dominant than in the US, there is a high risk of segregated networks that arise from the psychological preference to interact with similar people.

Appendix 1: Outline of Data Collection Principles

The main data collection principle was to always have at least two sources for the collected information to be taken into the sample. The exception of this being the education classifiers. In the case of conflicting evidence, given data points were left out.

Finnish Trade Register

The information of Finnish Trade Register was captured from both Kauppalehti Yrityshaku and Fonecta Finder. Direct URLs: https://www.kauppalehti.fi/yritykset/yrityshaku , https://www.finder.fi/

Bloomberg Research

Was used for double-checking the results and also as the main data source for international companies. Direct URL: https://www.bloomberg.com/professional/product/research/

Crunchbase

Community-led startup database. Direct URL: https://www.crunchbase.com/.

Linkedin

Sales Professional-search was utilized to double-check founder information and CEO-gender. Primary source for education classifiers. Direct URL: https://www.linkedin.com

Company websites

Meaning webpages with information about executive team, board of directors and founders.

The information retrieved from these sites was double-checked from other sources.

News articles

Referring to news articles covering the funding round or information about the founding team. Both Finnish and International medias were utilized in this.

Appendix 2: ICT Students in Finnish Universities 2001 - 2017

Year	Male students	% of total	Female students	% of total	Total
2001	13566	83.16%	2747	16.84%	16313
2002	14880	82.61%	3133	17.39%	18013
2003	15588	82.38%	3334	17.62%	18922
2004	16121	82.49%	3421	17.51%	19542
2005	16095	82.90%	3319	17.10%	19414
2006	16119	83.29%	3233	16.71%	19352
2007	15543	83.27%	3123	16.73%	18666
2008	14163	83.48%	2802	16.52%	16965
2009	14037	83.10%	2855	16.90%	16892
2010	13232	82.87%	2735	17.13%	15967
2011	12983	82.87%	2683	17.13%	15666
2012	12832	82.87%	2653	17.13%	15485
2013	12341	82.36%	2643	17.64%	14984
2014	11659	82.11%	2541	17.89%	14200
2015	11545	82.19%	2501	17.81%	14046
2016	11261	81.63%	2534	18.37%	13795
2017	11207	81.60%	2527	18.40%	13734

Source: Statistics Finland (2018)

Appendix 3: Distribution of female and male entrepreneurs in Finland by industry, 2011

Industry (NACE 2008)	% Female	% Male	% of all female entrepreneurs	% of all male entrepreneurs
Human health and social work activities	71	29	15.5	3.1
Education	61.6	38.2	29.1	8.9
Accommodation and food service activities	50.5	49.5	5.7	2.8
Administrative and support service activities	38.9	61.1	5.3	4
Professional, scientific and technical activities	35.6	64.4	14.3	12.7
Wholesale and retail trade	34	66	16.3	15.7
Financial and insurance activities	29.7	70.3	2.3	2.6
Manufacturing	22.8	77.2	6.1	10.3
Information and communication	9.9	90.1	1	4.3
Transportation and storage	9	91	2.5	12.5
Construction	3.5	96.5	1.7	23
Undefined activities	29.6	70.4	0.2	0.5
Total	**33.3**	**66.7**	**100**	**100**

Source: Ministry of Employment and Economy (2012)

References

Bertoni, F., Colombo, M. G., & Quas, A. (2015). The patterns of venture capital investment in Europe. Small Business Economics, 45(3), 543-560.

Brooks A., W., Huang L., Kearney S., W. & Murray F., E. (2014). Preference for attractive male entrepreneurs. Proceedings of the National Academy of Sciences, 111 (12) 4427-4431.

Brush, C., P. Greene, M. Hart, and P. Saparito. (2001). Patterns of Venture Capital Funding: Is Gender a Factor? Venture Capital Journal 3 (1): 62–83.

Brush, C., Carter, N., Gatewood, E., Greene, P., & Hart, M. (2003). Venture Capital Access: Is Gender an Issue? The Emergence of Entrepreneurship Policy: Governance, Start-Ups, and Growth in the U.S. Knowledge Economy 141-154.

Brush, C., N. Carter, E. Gatewood, P. Greene, and M. Hart. (2003). The Diana Project: Women Business Owners and Equity Capital: The Myths Dispelled. Kansas City, MO: Kauffman Foundation Report.

Brush, C., Greene, P., Balachandra, L. & Davis, A. (2018) The gender gap in venture capital- progress, problems, and perspectives, Venture Capital, 20:2, 115-136

Fried, V., and R. Hisrich. (1988). Venture Capital Research: Past, Present and Future. Entrepreneurship Theory and Practice 13: 15–29.

FVCA (2019) a. Venture Capital in Finland. Retrieved from: https://paaomasijoittajat.fi/wp-content/uploads/2019/04/Venture-Capital-in-Finland-2018.pdf

FVCA (2019) b. Inventure appoints two new partners: Ekaterina Gianelli & Linus Dahg to join the partnership. Retrieved from: https://paaomasijoittajat.fi/inventure-appoints-two-new-partners-ekaterina-gianelli-linus-dahg-join-the-partnership/

Jennings, J., and C. Brush. 2013. “Research on Women Entrepreneurs: Challenges to (and from) the Broader Entrepreneurship Literature.” Academy of Management Annals 7 (1): 661–713.

Kwapisz, A., & Hechavarría, D. M. (2017). Women don’t ask: An investigation of start-up financing and gender. Venture Capital, 20(2), 159-190.

Ministry of Employment and Economy (2012) Entrepreneurship Overview 2012. Retrieved from:https://tem.fi/documents/1410877/3342347/Yritt%C3%A4jyyskatsaus +2012+08112012.pdf

Moule, J. (2009). Understanding Unconscious Bias and Unintentional Racism. Phi Delta Kappan, 90(5), 320-326.

Mäkelä, M. M., & Maula, M. V. J. (2006). Interorganizational Commitment in Syndicated Cross–Border Venture Capital Investments. Entrepreneurship Theory and Practice, 30(2), 273–298.

Raina S. (2016) The Gender Gap in Venture Capital disappears when women fund women. Harvard Business Review. Retrieved from: https://hbr.org/2016/07/research-the-gender-gap-in-startup-success-disappears-when-women-fund-women

Rusko R., Härkönen K. & Petäjäniemi S. (2016). Pitching and Other International Practices of Innovation Competitions: Channel for Youth Entrepreneurship. Digital Entrepreneurship and Global Innovation, Chapter 7 p. 124-150

Statista (2018). Who are the Venture Capitalists. Retrieved from: https://www.statista.com/chart/14971/who-are-venture-capitalist/

Statistics Finland (2018). Students and qualifications in education leading to a qualification by location of education and education (National classification of education) in 2000 to 2017. PX-Web API. Retrieved from: http://pxnet2.stat.fi/PXWeb/pxweb /en/StatFin/StatFin__kou__opiskt /statfin _opiskt_pxt_001.px/?rxid=87a20647-f188-4887-aac4-8f8f48cf7352

Timmons, J. A., and W. D. Bygrave. (1997). Venture Capital: Reflections and Projections. In Entrepreneurship 2000, 29–46. Chicago, IL: Upstart Publishing

World Economic Forum (2018). Global Gender Gap Report 2018. Retrieved from: http://reports.weforum.org/global-gender-gap-report-2018/top-ten/